Blackboard
transaction System

LC3000 Laundry Reader

Installation and Setup Guide

Commerce Suite

Blackboard

The following information applies to wired LC3000 systems equipped with LCM20s only.

Blackboard Inc.	LC3000
FC	Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE	

This Class A digital apparatus complies with
Canadian ICES-003

The following information applies to wireless systems equipped with LWIs and LE3/BRIDGES only.

Blackboard Inc.	LWI30xx
FC	Tested To Comply With FCC Standards
FOR HOME OR OFFICE USE	

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Part 15.21: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Blackboard Date: 10/6/09 Doc. No.: 1135

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LC3000 LAUNDRY CENTER INSTALLATION

This manual provides instructions for selecting, installing, and configuring the Blackboard Laundry Center using the LC3000 Laundry Reader.

The LC3000 Laundry Reader controls laundry machines across a laundry Center network and Blackboard Transaction System (BbTS) and communicates with the user interface through a display, keypad, and mag-stripe reader. The network connections are 10/100 Base-T or RS-485, machine connections are wired or wireless.

Laundry Readers connecting to a Universal Edition Host in RS-485 mode require an IP Converter (IPC).

Universal Edition Hosts using RS-485 network connections do not support wireless communications with laundry machines.

WIRED SOLUTION

The wired solution reader supports up to 60 laundry machines across three connected Multiplexers. The first Multiplexer is installed inside the LC3000.

Each machine uses a Laundry Controller Interface (LCI), a wiring harness inside the machine, to facilitate communications between the laundry machine controller and LC3000 Laundry Reader.

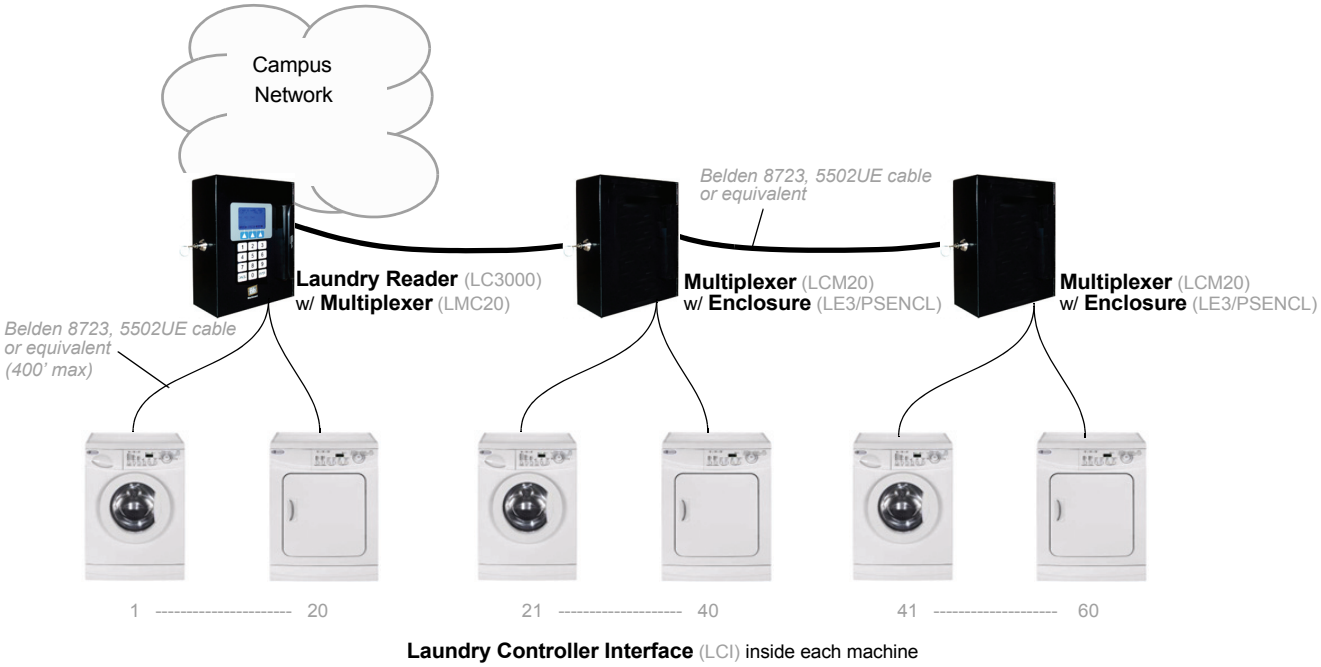


Figure 1-1 Wired LC3000 Laundry Center

WIRELESS SOLUTION

Up to 60 laundry machines can be connected wirelessly to the LC3000 using a Wireless Bridge (LE3/BRIDGE). Each Bridge communicates with laundry machines within 60 feet. Multiple Wireless Bridges can be used if stone or metal obstructions reduce the range. Each laundry machine connects to a Laundry Wireless Interface installed inside the machine. The Laundry Wireless Interface (LWI), a wiring harness and wireless module, facilitates communications between a laundry machine and the LC3000 Laundry Reader, via the Wireless Bridge.

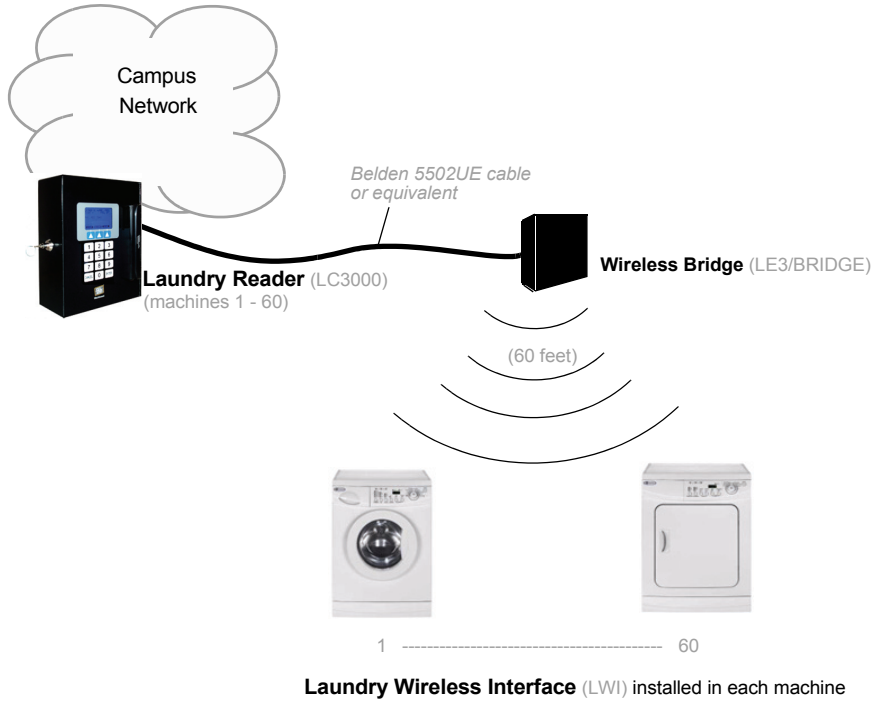


Figure 1-2 Wireless Laundry Center Solution

LAUNDRY CENTER COMPONENTS

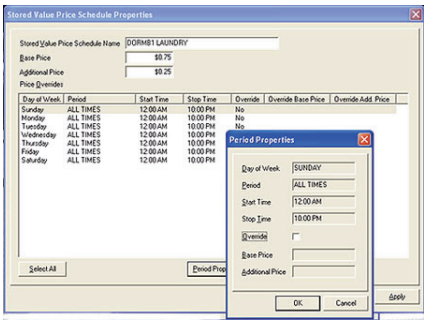
LC3000 Components

COMMON COMPONENT				
	Laundry Reader		LC3000	Each LC3000 supports up to 60 machines (stacked units count as 2 machines). *Wired installations require LCM20(s) and LCIs.* *Wireless installations require LE3/BRIDGE(s) and LWI(s).*
WIRED COMPONENTS				
	Laundry Controller Multiplexer		LCM20	Each LCM20 supports 20 wired machines. The first LCM20 is installed inside the LC3000. The second and third LCM20s each require a Power Supply Enclosure (LE3/PSENCL).
	Power Supply / Enclosure		LE3/PSENCL	An LE3/PSENCL power supply/enclosure is required for the 2nd and 3rd LCM20s. A 2nd LCM20 is required if the LC3000 is controlling more than 20 machines, a 3rd LCM20 is required if the LC3000 is controlling more than 40 machines.
	Interfaces	Maytag	LCI3010	All Maytag commercial debit-card ready machines are supported by the LCI3010. An LCI3010 is required for each single machine or for a complete stacked unit (both top and bottom unit supported by a single LCI3010).
		Speed Queen	LCI3020	Only Speed Queen NetMaster and MDC models are supported by the LCI3020. An LCI3020 is required for each single machine. Two LCI3020s are required to support a stacked unit.
		Whirlpool	LCI3030	Only Whirlpool Advantech models are supported by the LCI3030. A LCI3030 is required for each single machine. Two LCI3030s are required to support a stacked unit.
WIRELESS COMPONENTS				
	Wireless Bridge		LE3/BRIDGE	Each LE3/BRIDGE is the hub of a wireless network for up to 60 machines. The LE3/BRIDGE needs to be no further than 60 feet from each of the machines on its wireless network. The LE3/BRIDGE connects to the LC3000 via a standard CAT5 patch cable.
	Interfaces	Maytag	LWI3010	All Maytag commercial debit-card ready machines are supported by the LWI3010. A LWI3010 is required for each single machine or for a complete stacked unit (both top and bottom units are supported by a single LWI3010).
		Speed Queen	LWI3020	Speed Queen NetMaster and MDC models are supported by the LWI3020. A LWI3020 is required for each single machine or for a complete stacked unit (both top and bottom units are supported by a single LWI3020).

LAUNDRY CENTER INSTALLATION OVERVIEW

1 Configure Laundry Machines in BbTS.

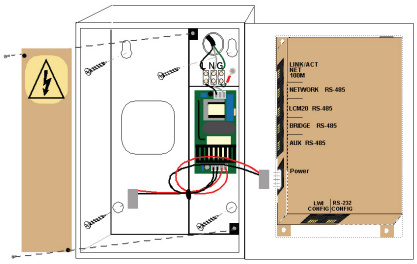
(see BbTS Universal System Administration Guide)



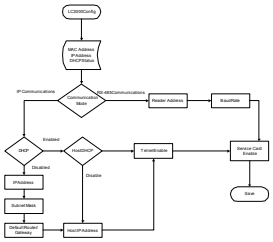
(see BbTS Unix Reference Manual)

Laundry Center
Change Machine Type
Blackboard Transaction System
QA - Release 9.3
Ver. 9.4
13:44 5/ 9/07
Number ..... 1 x 0001
Name ..... 2 x Washer II
Abbreviated Name ..... 3 x Washer II
Machine Class ..... 4 x Maytag Computer Trac 1 Washer
Price Class ..... 5 x Maytag Stack Dryer
Setup/Definitions ..... 6 x
Please Enter Choice : 02
PF1 Finished
PF3 Utilities
PF4 Help

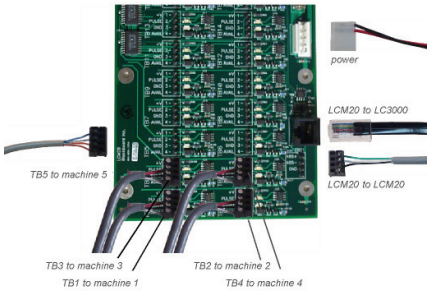
2 LC3000 Laundry Reader Installation (page 1-6)



3 LC3000 Laundry Reader Configuration (page 1-9)



4 Wired Laundry Machine Interface Installation (page 1-13) or Wireless Laundry Machine Interface Installation (page 1-22)



LC3000 LAUNDRY READER INSTALLATION

The LC3000 Laundry Reader must be mounted on a wall in a location that is convenient to cardholders and wiring requirements.

LC3000 MOUNTING LOCATION CONSIDERATIONS

- 120 VAC power availability

  Connect to 120 VAC @ 60 Hz. Connect only to a 15A maximum branch circuit protection or equivalent. Use a circuit breaker or switch to disconnect power when installing or removing the LC3000.
- Network communications availability (RS-485 or 10/100 Base T)
- Wiring distance limitations

  - RS-485 Communications 4000' total per loop

  - 10/100 Base-T Communications 300' from the network switch port
- Ease of cable routing to laundry machines (if wired configuration)
- Installation height regulations
- Cardholder convenience

Mounting hardware required: .25” appropriate to surface.

PREPARE ENCLOSURE

The Reader can be mounted flush to the wall with wiring behind the wall; or it can be surface-mounted with wiring in conduit exterior of the wall. Before mounting the enclosure, remove knockouts necessary for routing wires and/or attaching conduits. Remove only the knockouts required for your installation.

- AC power knockouts accept 1/2" conduit fittings.
- All other knockouts accept 3/4" conduit fittings.

  Flush-mount: *route machine wires, if wired, through the 3" x 3" cutout.*

  Surface-mount: *Remove conduit knockouts on the top and bottom of the enclosure for routing wire to machines.*
- Two power knockouts are provided in the upper right.

  Flush-mount: *Remove the knockout on the back side.*

  Surface-mount: *Remove the knockout on the top.*

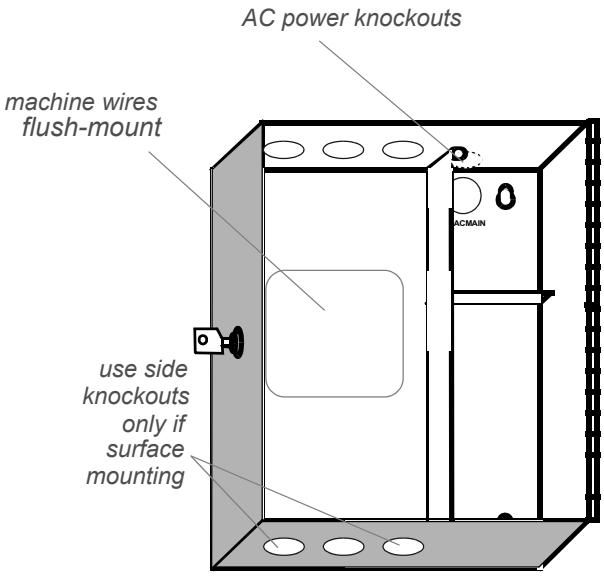


Figure 1-3 Mounting & Knockouts

Install the LC3000 Enclosure

5 Inside the LC3000, remove the power supply cover to access the upper right mounting hole.

Protect power supply from debris while mounting the enclosure.

6 Secure enclosure to a wall using hardware appropriate to wall material.

Mounting holes accept up to 1/4" hardware.

Disconnect external AC power when installing wiring.

7 Strip back insulation on AC wire .28" to prevent bare wire exposure when installed in AC terminal block.

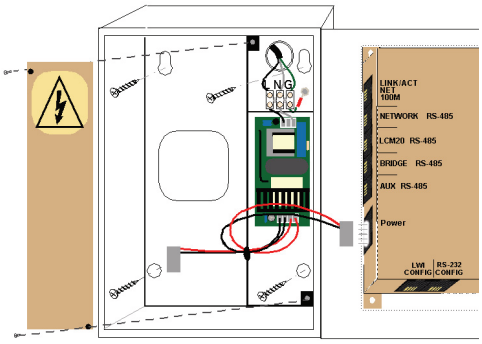


Figure 1-4 Power Installation

8 Install wires into the AC terminal block as shown in **Figure 1-5**, tighten the screws to 5 - 7 in-lbs., and replace power supply cover.

Ensure 120VAC wiring is confined within power supply compartment when cover is reinstalled to maintain UL compliance.

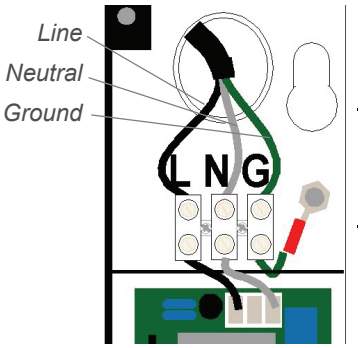


Figure 1-5 Power Connections

9 Reconnect external AC power.

10 Connect to Network.

The LC3000 provides for both 10/100 Base-T, TCP/IP and RS-485 BbTS network connections.

Once connected, configure the LC3000. See: the **LC3000 Laundry Reader Configuration** *(page 1-10).)*

LC3000 LAUNDRY READER CONFIGURATION

The Laundry Reader must be configured to communicate with the BbTS network.

LC3000 DEFAULT CONFIGURATION

- DHCP enabled
- NP (host) IP address assigned by DHCP server

CONFIGURATION METHODS

Configure the LC3000 Laundry Reader to interface with BbTS, using one of three modes:

- **Configure LC3000 Reader using front panel** (page 1-10)
- **Configure LC3000 Reader using RS-232** (page 1-11)

  The Reader's RS-232 can be used to connect to a computer using Hyperterminal
- **Configure LC3000 Reader using Telnet** (page 1-11)

  The Reader can be configured via IP if using Ethernet connections once it is assigned an IP address.

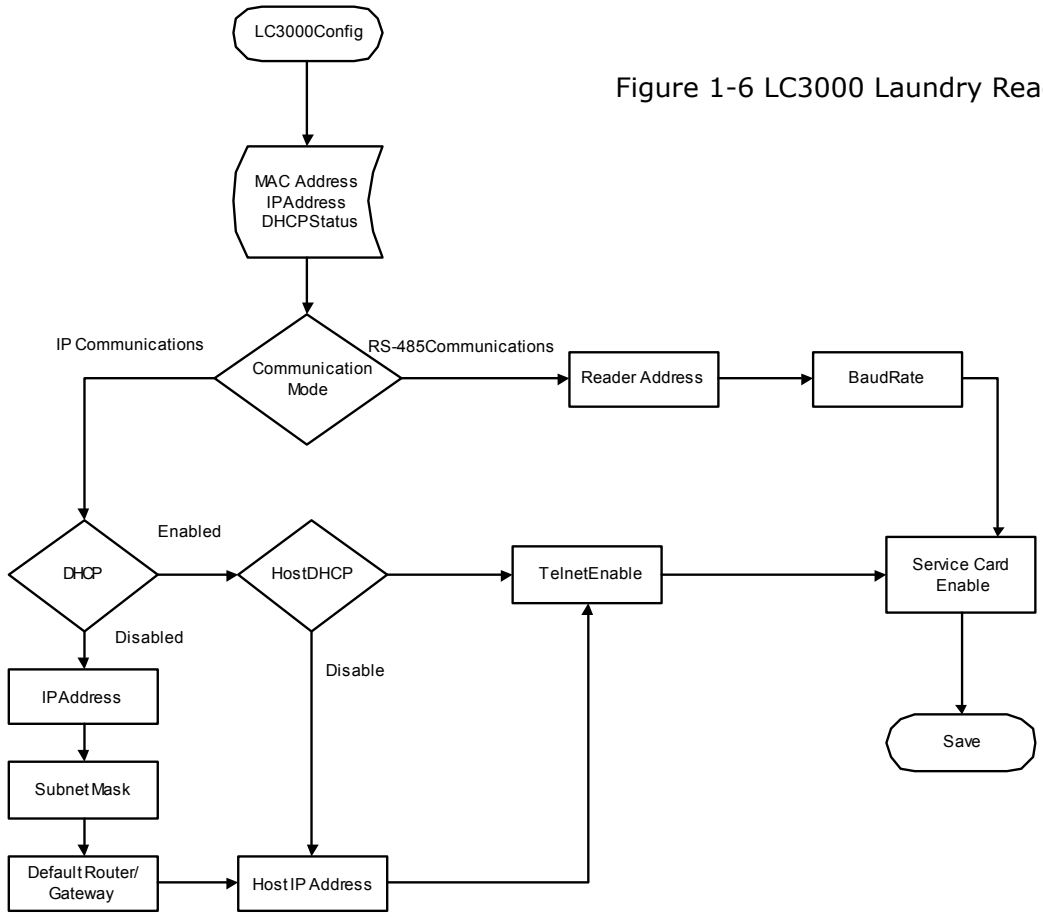


Figure 1-6 LC3000 Laundry Reader

***OFFLINE**: An asterisk (*) in the first line, second to the last position indicates the terminal is offline.*

Configure LC3000 Reader using front panel

1 Swipe a Service Card, and then press **NEXT** to start the configuration process.

2 Adjust each setup parameter using the keys displayed on the Terminal.

***ACCEPT** - Accept displayed value and advance to next setting.*

***CHANGE** - Change displayed value.*

***ABORT** - Abort configuration process.*

*To update the IP address and related information, press **CHANGE** when the parameter is displayed; then type the number using zeroes (0) as placeholders.*

Figure 1-7 Front panel configuration

3 Press **NEXT** when the **End of Config Setup** message displays, this saves the settings and reboot the reader.

The terminal may be offline for several minutes until it synchronizes with the Host.

Configure LC3000 Reader using RS-232

4 Connect a cable from a computer's serial port to the port on the LC3000 door labelled "RS-232 CONFIG".

See: **RS-232 Config Port Connections** *(Page: 11).*

5 Open a terminal program (e.g. Hyperterminal) and establish connection settings:

- 9600 baud
- 1 stop
- no parity
- no flow control

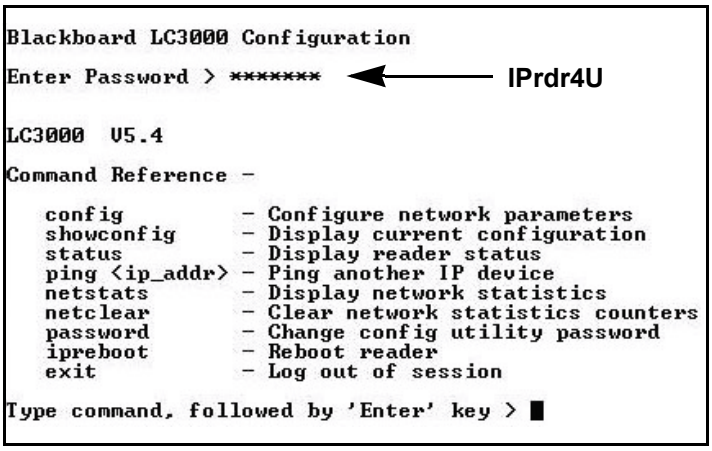

Blackboard LC3000 Configuration
Enter Password > *******
IPrdr4U
LC3000 V5.4
Command Reference -
config - Configure network parameters
showconfig - Display current configuration
status - Display reader status
ping <ip_addr> - Ping another IP device
netstats - Display network statistics
netclear - Clear network statistics counters
password - Change config utility password
ipreboot - Reboot reader
exit - Log out of session
Type command, followed by 'Enter' key >

Figure 1-8 LC3000 Configuration Menu

6 Log in using the default password: **IPrdr4U**.

The password is case sensitive. Consider changing the password.

7 At the prompt, type **config** and press **Enter**.

See: **LC3000 Laundry Reader Configuration** *(page 1-10) for configuration items.*

8 When complete, disconnect cable from RS-232 CONFIG.

Configure LC3000 Reader using Telnet

9 Open a Telnet session to the LC3000 Reader's IP address.

10 Log in using the default password: **IPrdr4U**.

The password is case sensitive. Consider changing the password.

11 At the prompt, type the following command and press **Enter** to start configuration:

config *to configure the LC3000. See:* **Figure 1-6 LC3000 Laundry Reader Configuration** *(page 10) for the configuration options.*

Table 1-1: RS-232 Config Port Connections

Signal	LC3000 (RJ-12)	PC Serial Port DB9 Connector
Ground	Pin 1	Pin 5
Receive (RX)	Pin 3	Pin 3
Transmit (TX)	Pin 4	Pin 2

COMM MODE SELECTION

OVERVIEW

The ‘Comm Mode’ selections on the CR3000, LC3000 and VR/MDBMP have been changed a few times in the history of the products.

When a given communication mode is selected, the unit reboots and starts a specific software executable type based on the communication mode chosen. Because the readers have 3 different software types loaded in them (and they can be individually updated when the unit comes online with a host), it is possible for the same unit to display different ‘Comm Mode’ selections depending on the current selection (and thus the current software type running).

SUMMARY

To correctly select the ‘Comm Mode’ for a CR3000, LC3000 or VR/MDBMP, you must determine which Selection List the currently running software has (by cycling through all the choices), then make the correct selection for the communication protocol you wish to use.

CR3000, LC3000 and VR/MDBMP ‘Comm Mode’ selections:

	Unix/Bb RS-485 protocol	**Bb IP/Ethernet protocol**	**Danyl protocol**
Selection list 1	RS-485	Ethernet	---
Selection list 2	485-UE	IP	485-WE
Selection list 3	485-Unix	IP	485-UE
Selection list 4	485-Bb	IP	485-Danyl

WIRED LAUNDRY MACHINE INTERFACE INSTALLATION

WIRED INSTALLATION OVERVIEW

- **Install the LCM20 in the LC3000** (page 1-15)
- **Install External LCM20(s) (if required)** (page 1-16)

  Only laundry centers with more than 20 laundry machines need External LCM20s. Each LCM20 communicates with up to 20 laundry machines.
- **Laundry Controller Interface (LCI) Installation** (page 1-18)

The wired Blackboard laundry solution supports up to 60 laundry machines. Multiplexers (LCM20s) facilitate up to 20 wired machine connections each. In laundry centers with 20 or fewer machines, a single Multiplexer is installed inside the LC3000 enclosure. Laundry Centers supporting more than 20 machines require additional Multiplexers and enclosures for mounting, power and protection. Order an enclosure, LE3/PSENCL, for each additional Multiplexer. The Reader supports three (3) Multiplexers.

Each Multiplexer connects to 20 machines, using a Laundry Controller Interface installed inside the machine. The Laundry Controller Interface (LCI) is a wiring harness that communicates with the laundry machine controller.

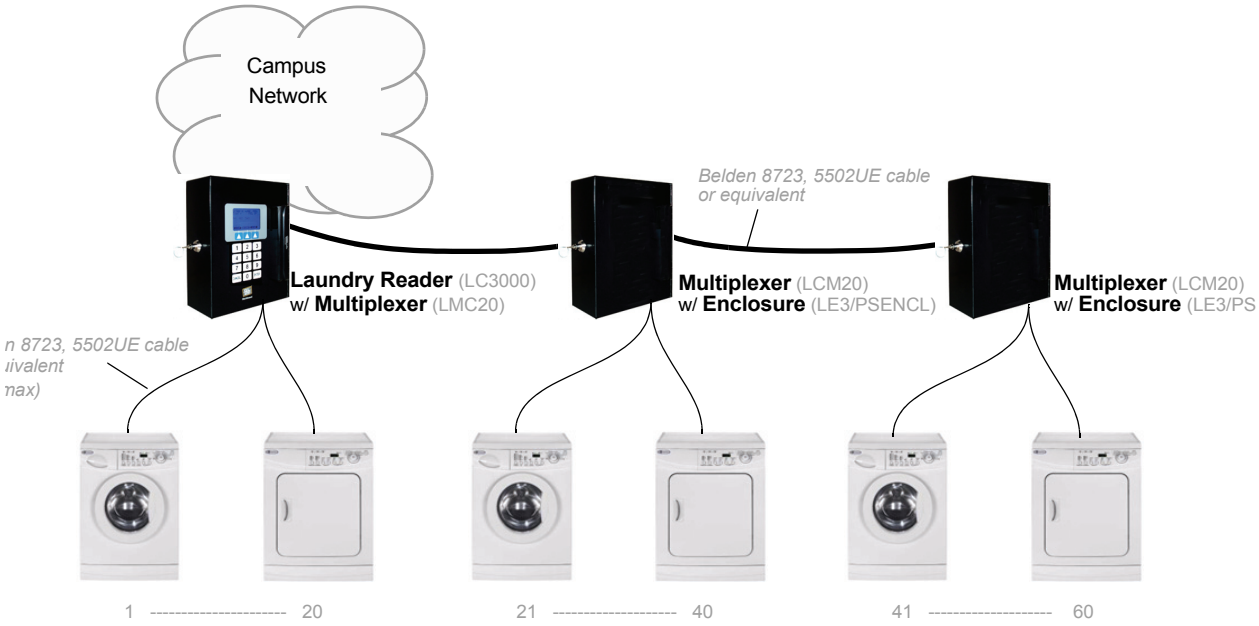


Figure 1-9 LC3000 Laundry Center Solution

LAUNDRY CONTROLLER MULTIPLEXER (LCM20) INSTALLATION

LCM20 PLACEMENT CONSIDERATIONS

- 120 VAC power availability

  Connect to 120 VAC @ 60 Hz. Connect only to a 15A maximum branch circuit protection or equivalent. Use a circuit breaker or switch to disconnect power when installing or removing the LC3000.
- Network communications availability (RS-485 or 10/100 Base-T)
- Wiring distance limitations

  - RS-485 Communications 4000' total per loop

  - 10/100 Base-T Communications 300' from network switch port

  - 400' from Multiplexer (LCM20) to the laundry machines
- Ease of cable routing to laundry machines

Install the LCM20 in the LC3000

1 With the enclosure door open, position the LCM20 over the six standoffs, with component side facing out (see: **Figure 1-10**).

2 Secure the LCM20 using #4-40 screws from the hardware kit.

3 Set the rotary address switch to position 0. See: **Figure 1-10**.

4 Connect LCM20 to the LC3000 Reader, using the provided RJ-45 communication cable.

5 Route 4-conductor cables from each LCM20 terminal block to a laundry machine (see: **Figure 1-11**).

Consider marking each cable uniquely for easy identification.

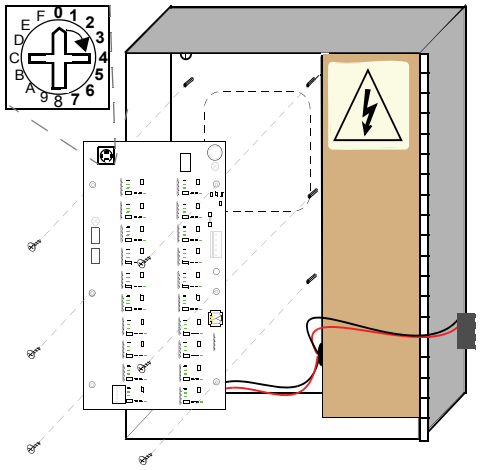


Figure 1-10 LCM20 in LC3000

Do not connect power to the LCM20 Board until all machine interfaces are terminated.

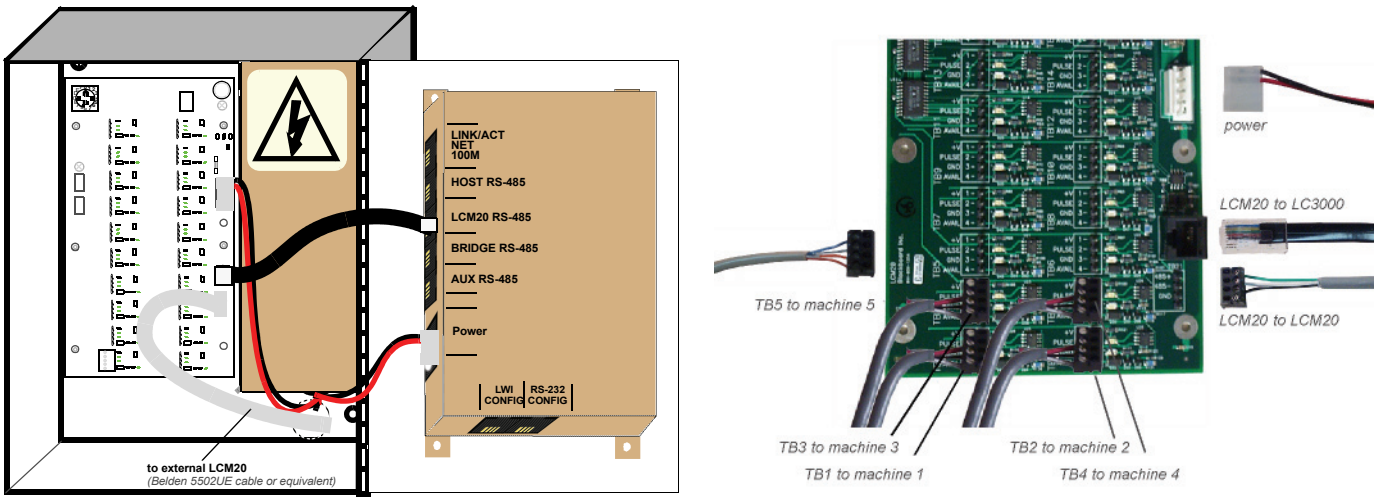


Figure 1-11 LCM20 Connections

Install External LCM20(s) (if required)

If your Laundry Center has more than 20 machines, an external LCM20 and LE3/PSENCL are required.

6 Inside the LE3/PSENCL, remove the power supply cover to access the upper right mounting hole (**Figure 1-12**).

Protect power supply from debris while mounting the enclosure.

7 Secure the enclosure to the wall using hardware for wall material.

Mounting holes accept up to 1/4" hardware.

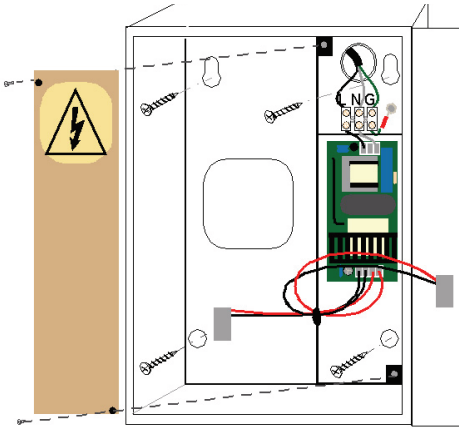


Figure 1-12 Power Supply access

Disconnect external AC power when installing wiring.

8 Strip back AC wire insulation .28", install wires into AC terminal block as shown in **Figure 1-13**, tighten screws to 5-7 in-lbs., and replace power supply cover.

Prevent bare wire from being exposed when installed in the AC terminal block.

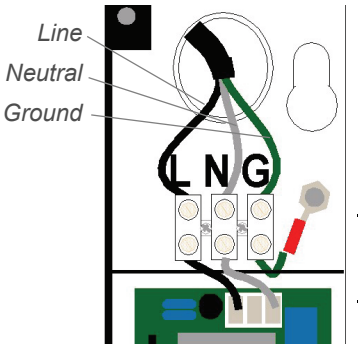


Figure 1-13 Power Connections

UL compliance: Ensure 120VAC wiring is within power supply compartment when cover is replaced.

9 Position LCM20, component side facing out, over the six standoffs, and secure using the #4-40 screws from the hardware kit.

10 Set rotary address switch to position 1 or 2.

Position 1: machines 21 - 40
Position 2: machines 41 - 60.

11 Route Belden cable from external LCM20 to LCM20 mounted inside the LC3000 enclosure.

Refer to **LCM20 and LE3/PSENCL Connections** *(page 1-17) for cable termination.*

12 Route a 4-conductor cable from each laundry machine to an LCM20 terminal block (TB1 - TB20).

Consider marking cables uniquely for easy identification.

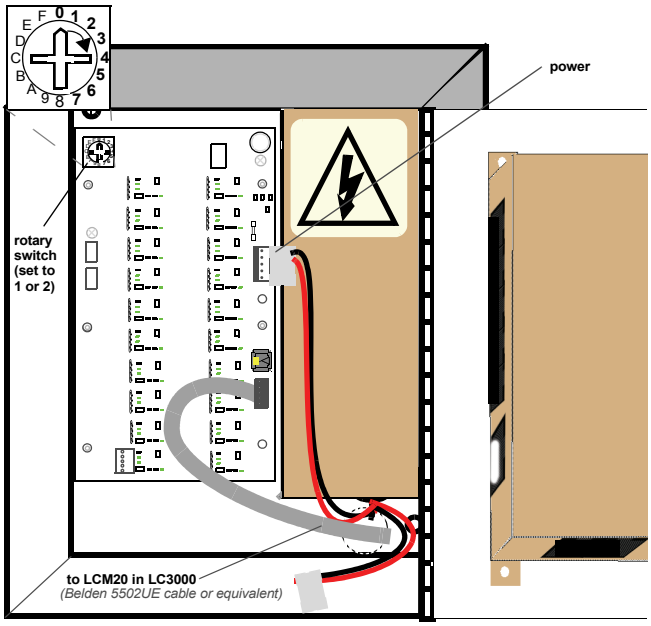


Figure 1-14 LCM20 and LE3/PSENCL Connections

Do not connect LCM20 power until all machine interfaces are terminated at both the laundry machine and the LCM20.

LAUNDRY CONTROLLER INTERFACE (LCI) INSTALLATION

The Laundry Controller Interface (LCI) is installed inside each laundry machine. The Laundry Controller Interface (LCI) is a wiring harness that connects to the laundry machine controller. The LCI is then connected to the Laundry Controller Multiplexer (LCM20) to communicate with Laundry Reader.

The Laundry Controller Interface (LCI) model used depends on the laundry machine manufacturer. See: **Laundry Center Components** (page 1-4) for Laundry Machine Interface (LCI) models. Each model includes cables, splices and wire ties.

To prevent tampering, run cable through flexible metal conduit from LCM20 to the back of the machine. If flexible metal conduit is not used, then a strain relief must be used to prevent damage to the cable.

LCI Installation instructions included are:

- **Install Maytag LCI3010 in Laundry Machine** (page 1-18)
- **Install Alliance/Speed Queen LCI3020 in Laundry Machine** (page 1-20)
- **Install Whirlpool LCI3030 in Laundry Machine** (page 1-21)

Install Maytag LCI3010 in Laundry Machine

Two cables are included to support stacked dryers. If installing a single machine, discard the two-wire cable.

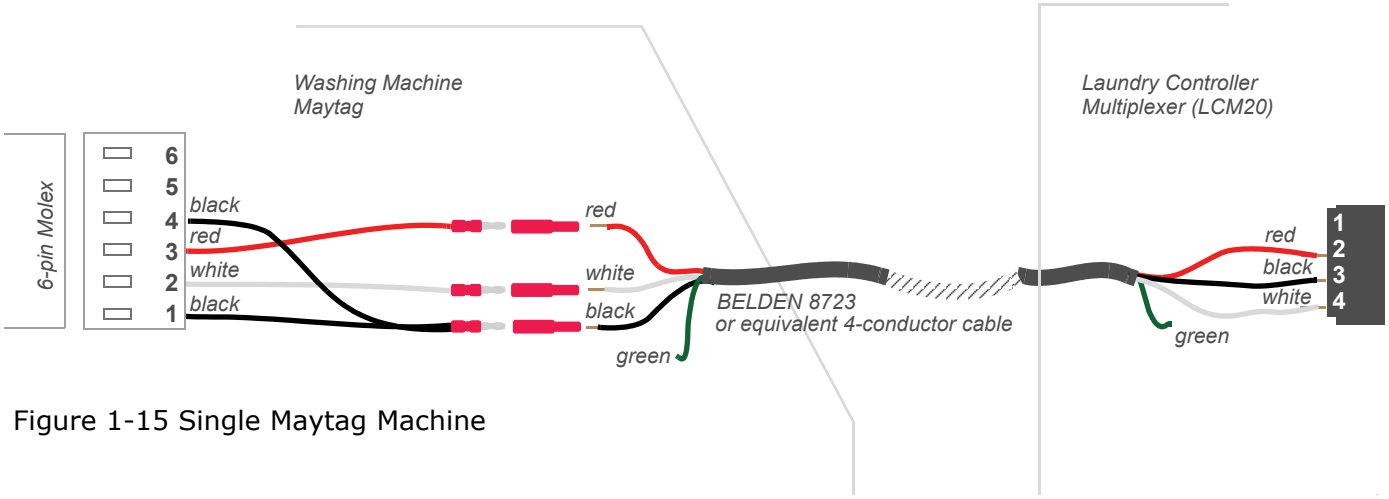


Figure 1-15 Single Maytag Machine

1 Remove the operator console (with display and switches) from the machine.

Only the screws in the top two corners need to be removed.

2 Route the 4-conductor cable from the LCM20 into the laundry machine for connection to the LCI.

3 Attach female connectors from the hardware kit to the machine end of the 4-conductor cable.

4 Insert the LCI male bullet connectors into the female connectors of the 4-conductor cable (white to white, black to black, etc.) see: **Figure 1-15**.

Stacked Machine: *connect the two-wire harness to the black and green wires, as shown.*

5 Install the LCI into the machine circuit board's six-pin Molex (see: **Figure 1-16**), and if a stacked dryer, adjacent 2-pin Molex.

6 Use the wire ties and wire tie blocks included in the hardware kit to dress the wires, and replace the laundry machine operator console.

7 Terminate the 4-conductor cable at the LCM20 1 x 4 terminal block(s).

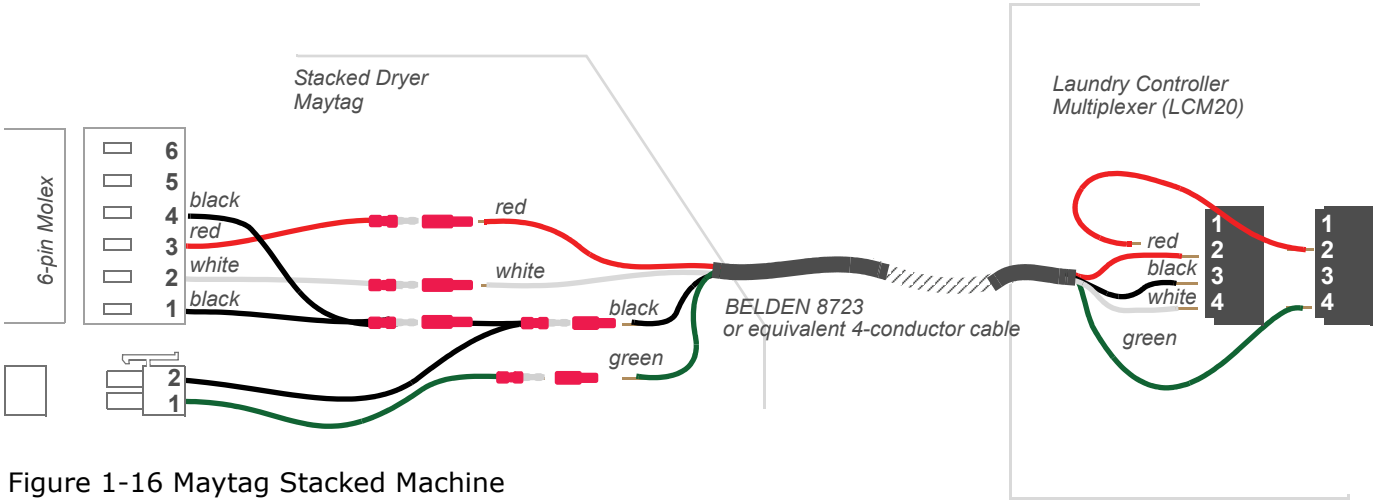


Figure 1-16 Maytag Stacked Machine

Switch the green and white wires if the signals do not correspond to the machines as labeled.

Install Alliance/Speed Queen LCI3020 in Laundry Machine

Two LCI3020s must be ordered when wiring to a stacked dryer.

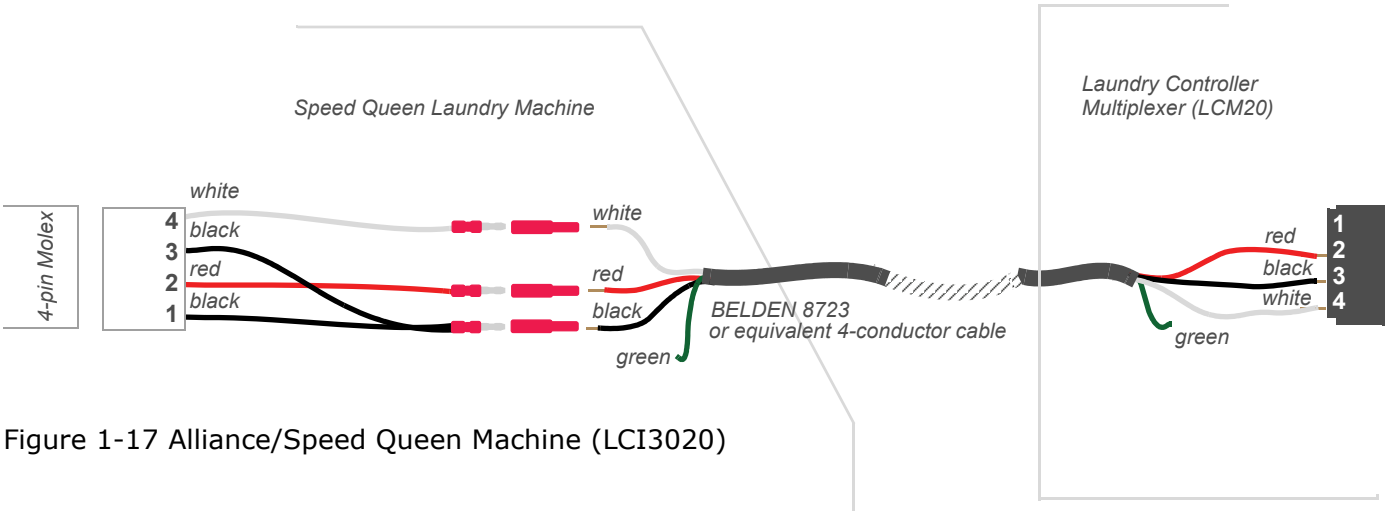


Figure 1-17 Alliance/Speed Queen Machine (LCI3020)

8 Remove the operator console from the machine.
Refer to the Speed Queen service manual.

9 Route the 4-conductor cable from the LCM20 into the machine (see: **Figure 1-17**).
Stacked Machine: *run two cables.*

10 Attach female bullet connectors from the hardware kit to the machine end of the 4-conductor cable.
Use a strain relief or other means to protect and secure the cable where it enters the machine.

11 Insert the LCI male bullet connectors into the female connectors. (white to white, black to black, etc.).
Stacked Machine: *perform the same process on the second cable.*

12 Insert the four-pin Molex connector into the machine circuit board, as illustrated in **Figure 1-17**.
Stacked Machine*: insert the second four-pin Molex connector into the second machine circuit board.*
Some Speed Queen machines have a 1 x 7 header; in this case, the LCI 1 x 4 header fits onto pins 1 - 4, labelled ***START IN*** *and* ***AVAIL OUT****.*

13 Use the wire ties and blocks included in the hardware kit to dress the wires.

14 Terminate 4-conductor cable at the LCM20 1 x 4 terminal block(s).

Install Whirlpool LCI3030 in Laundry Machine

Stacked dryers require two LCI3030s.

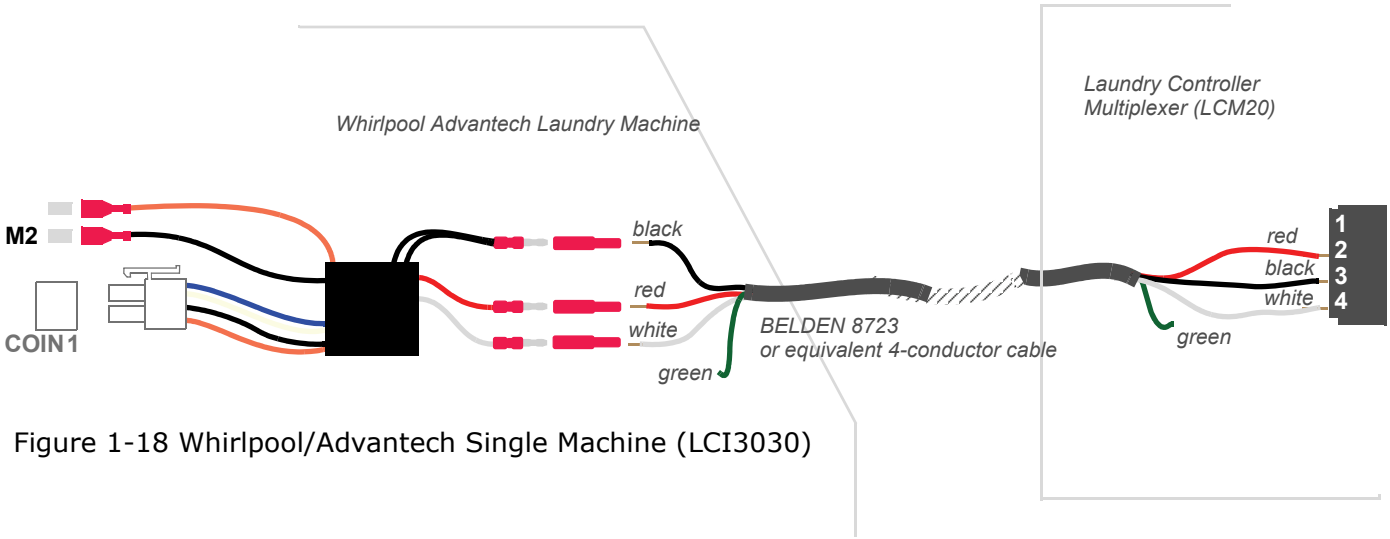


Figure 1-18 Whirlpool/Advantech Single Machine (LCI3030)

15 Remove the operator console from the machine.
Refer to Whirlpool service manual.

16 Route the 4-conductor cable from the LCM20 into the machine.
If the installation is for a stacked machine, route two cables.

17 Attach female connectors from the hardware kit to the machine end of the 4-conductor cable wires.
Use a strain relief or other means to protect and secure the cable where it enters the machine.

18 Insert the LCI male bullet connectors into the female connectors (white to white, black to black, etc.).
Stacked Machine:** the additional two-wire harness must be connected as shown in* **Figure 1-18. The second LCI fits into the second, independent circuit board as illustrated.*

19 Attach the orange wire female disconnect to the **M1** spade lug and the black wire with the female disconnect to the **M2** spade lug on the controller board.

20 Connect the 4-pin Molex to the **COIN #1** mating connector on the laundry machine controller board.

21 Use the wire ties and wire tie blocks, included in the hardware kit, to dress the wires.

22 Terminate 4-conductor cable at the LCM20 1 x 4 terminal block.
Be sure terminal block numbers match laundry machine numeric identifiers.

The Whirlpool control board must be configured for the coin drop, in addition to the configuration for the BbTS host.

WIRELESS LAUNDRY MACHINE INTERFACE INSTALLATION

WIRELESS LAUNDRY CENTER INSTALLATION OVERVIEW

- Configure laundry machines in BbTS and download configurations to the Reader.

  See: the BbTS Reference Manual (Unix), or the BbTS System Administration Guide (UE).
- **Configure the LE3/BRIDGE** (page 1-23)
- **Install the LE3/BRIDGE** (page 1-24)
- **Configure the LWI Module** (page 1-25)

  Each laundry machine is assigned a number between 1 and 60. The LC3000 displays this number for customer machine selection and sends the pulse command to the corresponding LWI. Configuring the LWI creates the relationship between the machine number and LWI.
- **Install the LWI Module** (page 1-26)

The LC3000 Laundry Reader supports 60 wireless laundry machine connections. Laundry machines communicate with the wireless laundry network using Laundry Wireless Interfaces. The Laundry Wireless Interface (LWI) is a wiring harness and wireless module. The LWI communicates with the Laundry Reader via a Wireless Bridge(s) (LE3/BRIDGE). The Bridge and LWI communicate over an RF radio link.

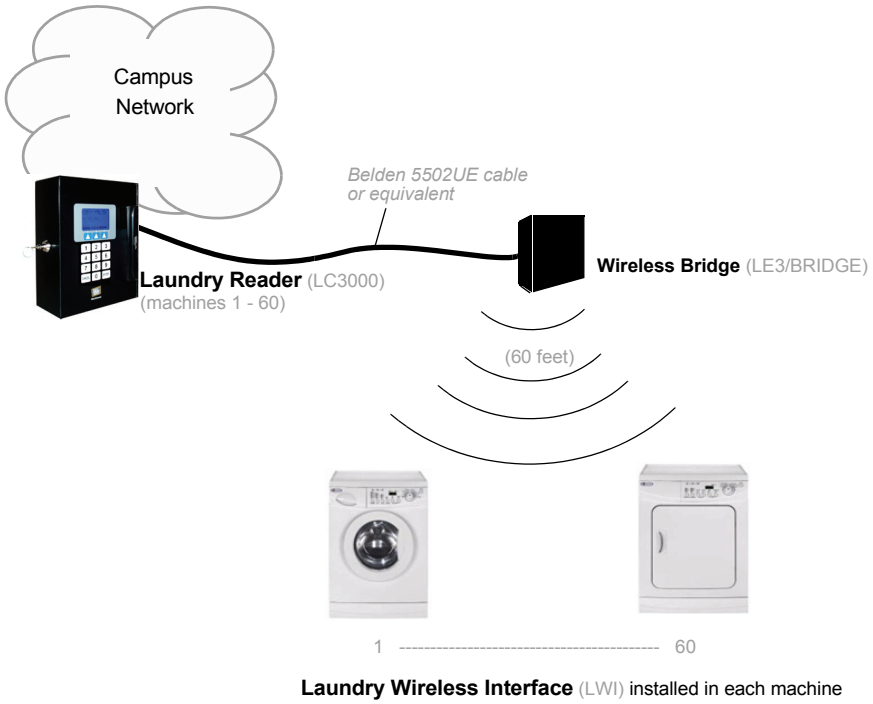


Figure 1-19 Wireless Laundry Center Solution

All washers and dryers must be defined at the host server before the LWI modules can be configured. The machine type (washer/dryer), manufacturer, and stack configuration are included in the host server configuration options.

WIRELESS BRIDGE LE3/BRIDGE INSTALLATION

The LE3/Bridge module must be configured prior to being installed. This requires programming a network ID and configuring the module as a Bridge.

Configure the LE3/BRIDGE

1 Apply power to the LC3000 Reader and make sure that it is online.

2 Install the configuration cable (p/n 044-042-043) into the RJ-12 Jack labeled **LWI CONFIG**.

This cable is supplied with the LE3/BRIDGE.

3 Plug the 22-pin Molex connector into the mating connector of the Bridge module.

4 The LC3000 will detect the module, and load the current version of software if necessary. The top two lines of the display show the machine ID, software version and network ID.

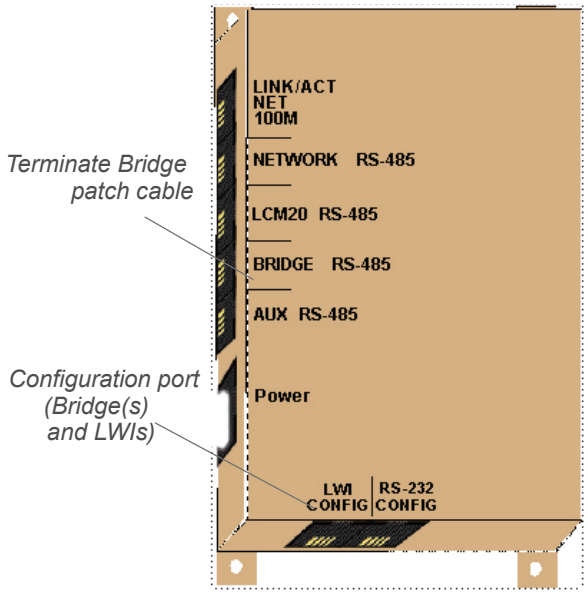


Figure 1-20 Bridge Connections

*The factory default for the network ID and machine ID is **. If the module has been assigned previously, the message **Already Assigned** is displayed. In this case, enter **1** for yes, to reassign the network ID.*

5 Enter the network ID.

Network values are 1 through 6.

6 Press **OK**.

Note: Always select a network ID that has not been chosen on a nearby LC3000 Laundry Center wireless network. A nearby network is considered any installation within the same building and/or less then 500 feet.

7 Set the LWI type by selecting **2** to configure the module as a Bridge.

8 Remove the module from the 22-pin Molex connector.

Note: Remove a bridge with the Remove Bridge command; ***removebridge value*** *(value = 1-7)*

Install the LE3/BRIDGE

A Plastic enclosure is included with the LE3/BRIDGE. The enclosure houses the Bridge module and must be mounted externally from the LC3000 Reader. Placement of the enclosure should meet the following criteria:

- Centrally locate to minimize distance to any laundry machine
- Mount on ceiling, or elevated location to increase range
- Avoid locations near metal objects
- Avoid having obstructions between the LE3/BRIDGE and laundry machines

1 Select the appropriate hardware and mount the LE3/BRIDGE enclosure.

2 Install 1/2” PVC conduit from the LC3000 to the enclosure.

3 The LE3/BRIDGE includes two configuration cables (p/n 044-042-043). This cable has an RJ-45 connector and a 22-pin Molex connector. Plug the 22-pin connector into the Bridge module.

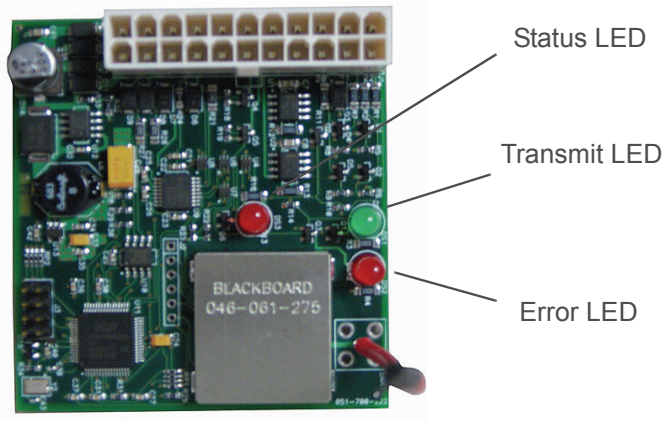


Figure 1-21 Wireless Bridge

4 A patch cable is required to span the distance between the LE3/BRIDGE enclosure and the LC3000 Reader. Pull the Patch cable through the conduit. Install the RJ-45 inline coupler between the patch cable and the configuration cable. Install the opposite end of the patch cable into the jack labeled **BRIDGE RS-485** of the LC3000 Reader.

5 Place the Bridge module into the enclosure.

6 Verify communication between the Bridge module and LC3000 Reader using the status LED. The LED should be blinking approximately once every second. Install the cover onto the plastic enclosure to enclose the cable and module.

The wire antenna must be slightly arced when the cover is installed.

For Troubleshooting and Operation Information, See: **Wireless Module Troubleshooting and Operation** *(page 30)*

LAUNDRY WIRELESS INTERFACE MODULE (LWI) INSTALLATION

Configure the LWI Module

Before installing an LWI module in a washer or dryer, the module must be configured. Configuring consists of assigning a network ID and machine ID. These two parameters make each LWI module unique within the wireless network, ensuring only a single module responds to a command from the Bridge.

The network ID can be assigned the values 1 through 6. This number must be identical to the number assigned to the Bridge. This value sychronizes the communication between the Bridge and the LWI module by selecting the appropriate frequency hopping table.

The machine ID can be assigned the values 1 through 60. This number corresponds to the unique number assigned to each washer/dryer located in the Laundry Center. Each washer and dryer must be labeled with the machine number. The number should be clearly visible to patrons using the Laundry Center.

For Stack Dryers, a single module is used to support both upper and lower machines. The top machine must be assigned the odd number, the lower machine the even number. The even number must always be 1 more than the odd number. Thus valid pairs are (1, 2), (3, 4) and (29, 30) and so forth. An invalid combination would be (28, 29). This would be considered as separate machines at the host software level. The assignment of the top machine being an odd number is the result of the electrical connection between the wiring harness and module.

It is imperative the LWI module, once programmed with the machine ID, be installed in the corresponding labeled laundry machine. A label is provided on the side of the module, to allow the installer to write the machine ID programmed into the module.

1 Apply power the LC3000 Reader and make sure it is online.

2 Install the configuration cable (p/n 044-042-043) into the RJ-12 jack labeled **LWI CONFIG**.
This cable is supplied with the LE3/BRIDGE.

3 Plug the 22-pin connector into the mating connector of the LWI module.

*The LC3000 Reader will detect the LWI module. The top two lines of the display show the machine ID, software version and network ID. The factory default for the network ID and machine ID is **FF**. If the LWI module has previously been assigned, the message **Already Assigned** is displayed. In all cases, enter **1** for **yes**, to reassign the network ID and/or machine ID.*

4 Set the Network ID.

Valid values are 1 through 6. This value must match the network ID selected for the Bridge.

5 Set the machine ID.

Valid Values are 1 through 60.

It is imperative the LWI module, once programmed with the machine ID, be installed in the corresponding labeled laundry machine. A label is provided on the side of the module, to allow the installer to write the machine ID programmed into the module.

6 When programming has been completed, disconnect the LWI module from the configuration cable.

Note: The steps listed above must be repeated for each LWI module to be installed in the Laundry Center. When programming the machine ID, the values should be written on the label provided to ensure it is installed in the correct washer or dryer.

---

*Note: Remove an LWI with the remove LWI command; **removelwi value** (value = 1-60).*

Install the LWI Module

To install an LWI module, either the hood or front panel of the laundry machine will have to be removed to gain access to the electronic control board. Consult the manufacturer's manual for steps to perform this task. Each LWI30xx contains a wiring harness for connecting the LWI module to the laundry machine's control board. All wiring harnesses support both single and stacked machines. If installing in a single machine, some connectors may not be used.

In a typical installation, the LWI module can be installed inside the laundry machine. However, if a laundry machine is more then 75 feet from the LE3/BRIDGE, it may be necessary to mount the module on the outside of the laundry machine for best reception. Sheet metal screws are provided with the module.

For Troubleshooting and Operation Information, see: **Wireless Module Troubleshooting and Operation** *(page 30).*

INSTALL THE LWI3010 MODULE FOR MAYTAG LAUNDRY MACHINES

Maytag laundry machines require an LWI3010 module. A single LWI3010 will support both single washer/dryer machines and stacked dryer machines.

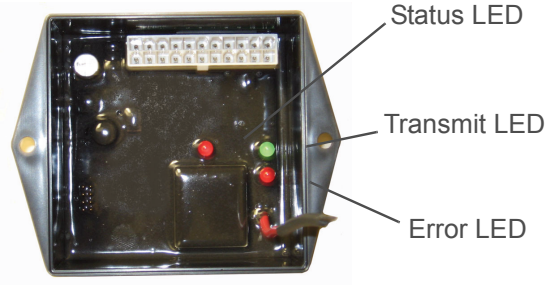


Figure 1-22 LWI wireless module

Disconnect all power to the machines.

1 Remove the operator console (with display and switches) from the machine.

***Single machine**: remove only the top two screws.*

***Stacked machine:** remove only the lower two screws on the top panel.*

2 With access to the machine's control board, Install the six-pin connector of the wiring harness into the (AA3) connector of the laundry machine's control board.

***Stacked machines:** Install the 2-pin connector on the wiring harness into the (AA2) connector of the control board.*

3 Install the 22-pin connector of the wiring harness into the LWI3010 wireless module.

4 Mount the wireless module inside the hood compartment using the double-sticky tape provided, or install the module on the outside of the machine using the sheet metal screws.

If installing inside the hood compartment, keep the module away from the control board and any potential electrical interference sources.

5 Use the wire ties and wire tie blocks included with the LWI3010 to dress the wires within the compartment.

6 Re-install the operator console on the machine.

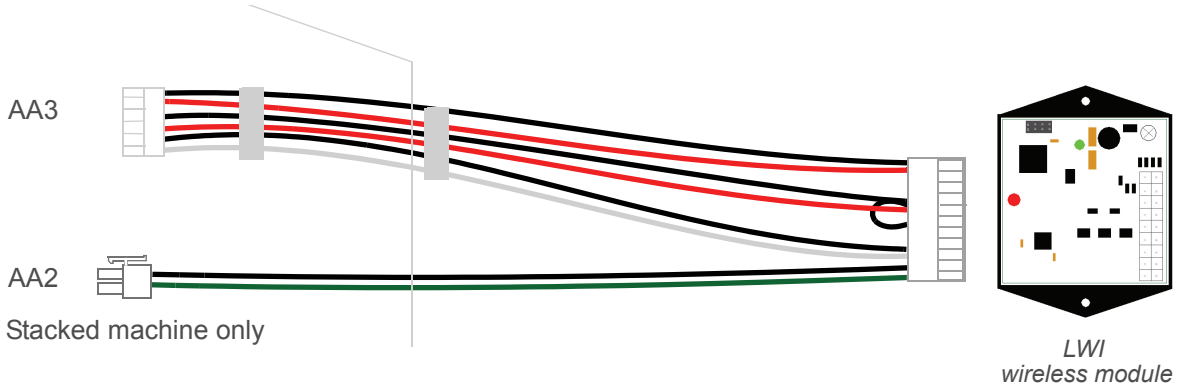


Figure 1-23 LWI3010 installation in Maytag laundry machine

INSTALL THE LWI3020 MODULE FOR ALLIANCE/SPEED QUEEN LAUNDRY MACHINES

Alliance/Speed Queen laundry machines require an LWI3020 module. A single LWI3020 will support both single washer/dryer machines and stacked dryer machines.

Before installing an LWI3020, verify that the transformer in the machine is the correct type. The transformer should have 4 Red wires on the secondary side. If there are only 2 wires, then the transformer must be replaced. The correct transformer is (p/n 201375P), and can be ordered from Alliance Laundry Systems through your laundry supplier.

Disconnect all power to the machines.

1 Remove the operator console (with display and switches) from the machine.

Single machine: *remove only the top two screws.*

2 With access to the machine's control board, install the 4-pin connector of the wiring harness labeled **P1** onto the (**H5**) connector of the laundry machine's control board.

*The **H5** connector may be either 4 or 7 pin. If the connector has 7 pins, the **P1** connector must be installed on pins 1 through 4.*

When installing the LWI3020 onto a stacked machine, the P2 connector must be installed into the control board of the even numbered machine. For example, if the stacked machine will be assigned machines 3 and 4 within the laundry center, then the P1 connector would be installed in the control board identified as machine 3 and the P2 connector must be installed in the control board of the machine identified as machine 4.

3 Install the two Molex pins connected to the Orange and Blue wires on the wiring harness into the two open positions of the transformer's secondary output connector.

This is an AC output, so the pins are interchangeable.

4 Install the 22-pin connector of the wiring harness onto the LWI3020 wireless module.

5 Mount the wireless module inside the console compartment using the double-sticky tape provided, or install the module on the outside of the machine using the sheet metal screws.

If installing inside the hood compartment, keep the module away from the control board and any potential electrical interferences.

6 Use the wire ties and wire tie blocks included with the LWI3020 to dress the wires within the compartment.

7 Re-install the operator console on the machine.

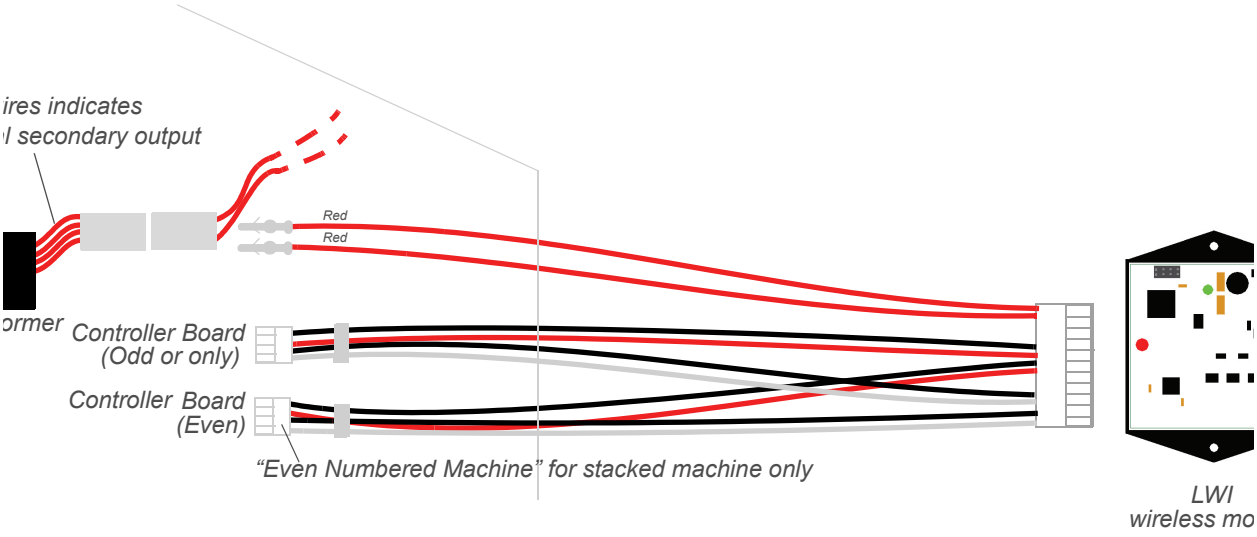


Figure 1-24 LWI3020 installation in Speed Queen/Alliance laundry machine

WIRELESS MODULE TROUBLESHOOTING AND OPERATION

BRIDGE MODULE:

The Red STATUS LED located near the center of the board blinks when a message is received from the LC3000 Reader. Communication is over RS-485. When the bridge is attached to the LC3000 Reader, the red status LED should blink once per second. If the LED is not blinking, the bridge has not been configured in the reader (see: the **Wireless Bridge LE3/BRIDGE Installation** (page 23)).

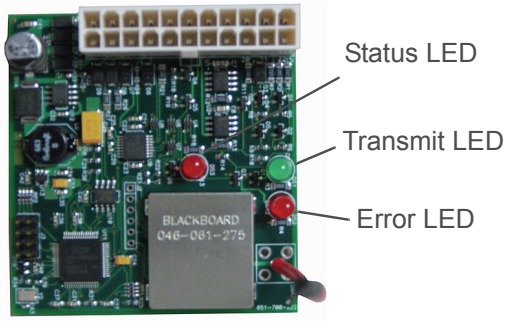


Figure 1-25 Bridge Module LEDs

The Green TRANSMIT LED located near the edge of the board is turned on whenever a radio packet is being transmitted by the Bridge.

The Red ERROR LED located near the edge of the board is turned on when a radio packet was not received from a polled LWI module or if an error was detected in the received packet.

When LWI Modules are configured in the LC3000 Reader, the green TRANSMIT LED on the Bridge will start blinking. This indicates the Bridge is transmitting packets to the module. If the module is not responding, the Red Error LED will blink as well.

The red ERROR LED starts blinking immediately as each LWI module is configured. This continues until the module has been installed in the Laundry machine and it has locked to the Bridge.

LWI MODULE:

The Red STATUS LED located near the center of the board blinks when a message is received from the Bridge. The frequency of the blinking depends on the number of LWI modules configured on the Bridge. As more modules are added, the blink rate decreases.

The Green TRANSMIT LED located near the edge of the board is turned on whenever a radio packet is being transmitted by the LWI module.

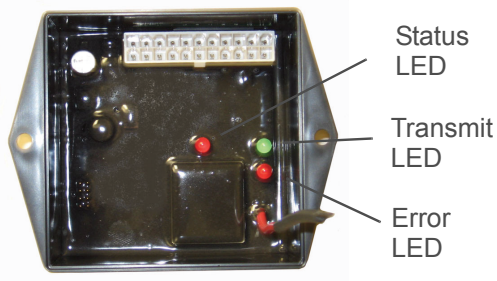


Figure 1-26 LWI Module LEDs

The Red ERROR LED located near the edge of the board is turned on when a radio is received but an error was detected in the packet.

When the LWI module is first powered on, it will attempt to lock to the Bridge radio. The red ERROR LED is turned on and remains on until a valid message is detected from the Bridge. The module then turns on the green TRANSMIT LED and the module begins frequency hopping to synchronize with the Bridge. When a packet is received, the red STATUS LED blinks. This continues until the LWI receives a packet containing a matching machine ID. At this point, the LWI module locks and operates in the normal mode, blinking the red STATUS and green TRANSMIT LEDs. Note, if the red STATUS LED continuously blinks at a high rate and the green TRANSMIT LED remains off, this indicates the LWI module has not seen its machine ID in any received packet. This occurs when the LWI module is not configured in the Bridge.

APPENDIX

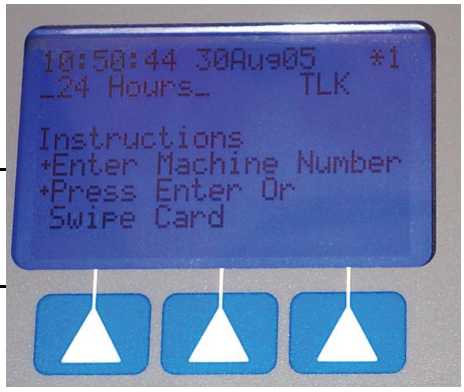
FEATURES

- Interfaces to: Maytag commercial “debit-card” ready, Speed Queen NetMaster and MDC, and Whirlpool Advantech laundry machines
- TCP/IP and wireless protocols encrypted using AES
- Configuration via keypad/display, CONFIG port or telnet
- Keypad (Service Card) configuration can be disabled
- Telnet access can be disabled
- Stores up to 40,000 transactions offline
- Displays balance, account warnings and other messages following transactions
- Adjustable volume setting
- Graphics display supports 8 lines X 21 characters text
- Backlight display
- Contains a keyed lock to secure the inside of the unit, along with a hinged door to access the circuit boards

  High security lock and keys can be purchased:Medeco 60W-0750-239 from RA-LOCK Company (800-777-6310).
- Supports 10/100Base-T or RS-485 communication
- Supports wired or 900 MHz wireless communication to laundry machines
- Compatible with BbTS Universal and Unix Editions
- Reader supports up to 60 laundry machines
- Software downloads remotely

TRANSACTION PROCESS

The LC3000 Laundry Reader displays cardholder instructions. When idle, the reader display toggles between instructions and machines available.



***Offline messages** are only displayed if offline operations are allowed in the reader configuration at the host and card number is valid.*

TRANSACTION PROCESS

1 Select a machine by using the Reader's numeric keypad, and press **Enter**.

The machine's status displays:

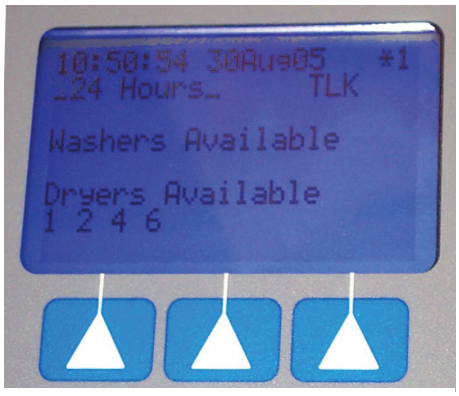
- *Available*
- *Out of Service (machine not configured)*
- *Machine # Invalid (machine # greater than 60)*

2 Swipe a card within 10 seconds.

Otherwise, the transaction is aborted.

3 The transaction is deducted from the cardholder account.

The reader displays instructions to load clothes and start machine.



"*" indicates the reader is offline
The next character:
E - empty, no stored transactions
1 - less than 11% full
2 - less than 22% full
.
.
9 - less than 99% full
F - full

*If the machine is not started, refunds **do not** occur automatically.*

***Cancel Transaction:** Press the **Cancel** button before swiping card.*

ADD DRY TIME

Additional dry time may be added before or during dry cycle.

4 Select a machine by using the Reader's numeric keypad, and then press **Enter**.

The machine number, Total Cost (the amount that will be charged for the original cycle plus any additional cycles), and cost of an additional cycle is displayed.

5 Press the **Add Time** softkey to display the cost and time (in minutes) of an additional cycle.

Pressing Add Time again multiplies the additional dry time and increases the Total Cost to reflect the Total Transaction amount.

6 Swipe a card within 10 seconds.

The reader displays instructions to load clothes and start machine.

MANAGER MENUS

The Manager Card is used to access LC3000 Laundry Reader menus for sales data and modifying reader settings.

Manager Menus

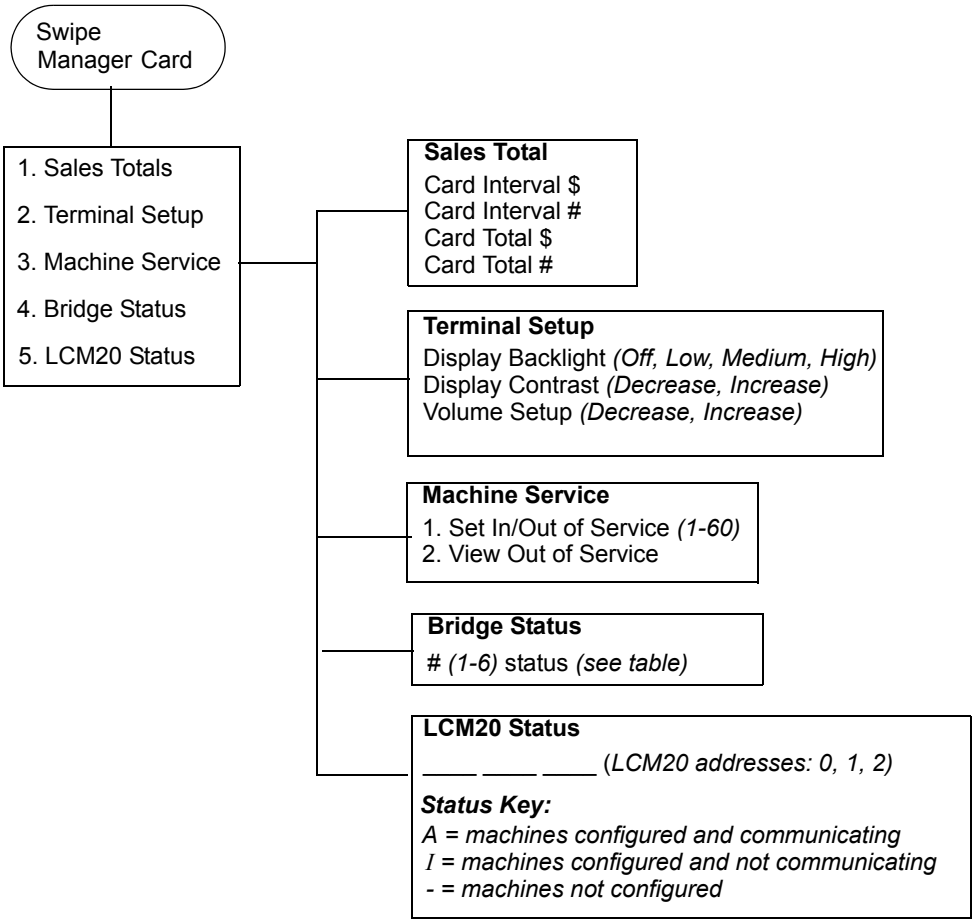


Figure 1-27 Manager Menus

Table 1-2: Bridge Status

Display Message	Description
Not Defined	This Bridge is not configured by the LWI CONFIG port.
No Bridge Comm	This Bridge is configured, but is not successfully communicating with the BRIDGE RS-485 port.
No LWIs Defined	This Bridge is successfully communicating with the BRIDGE RS-485 port, but no LWIs are defined for this Bridge.
No LWI Communication	One or more LWIs are defined for this Bridge, but no LWI communication exists.
LWI Communication OK	One or more LWIs are configured for this Bridge and all are successfully communicating with the Bridge.
LWI Communication	One or more LWIs are configured for this Bridge, but some are not successfully communicating with the Bridge.

LAUNDRY COMPONENTS DIMENSIONS AND WEIGHT

- **LC3000:** 9.6" H x 7.92" W x 3.3" D, 7.6 lbs.
- **LE3/PSENCL:** 9.6" H x 7.92" W x 3.3" D, 7.6 lbs.
- **LE3/BRIDGE:** 4.5" H x 4.5" W x 2" D, 1.0 lb.
- **LWI30XX**: 3" H x 3" W X 1.5" D, 1.0 lb.

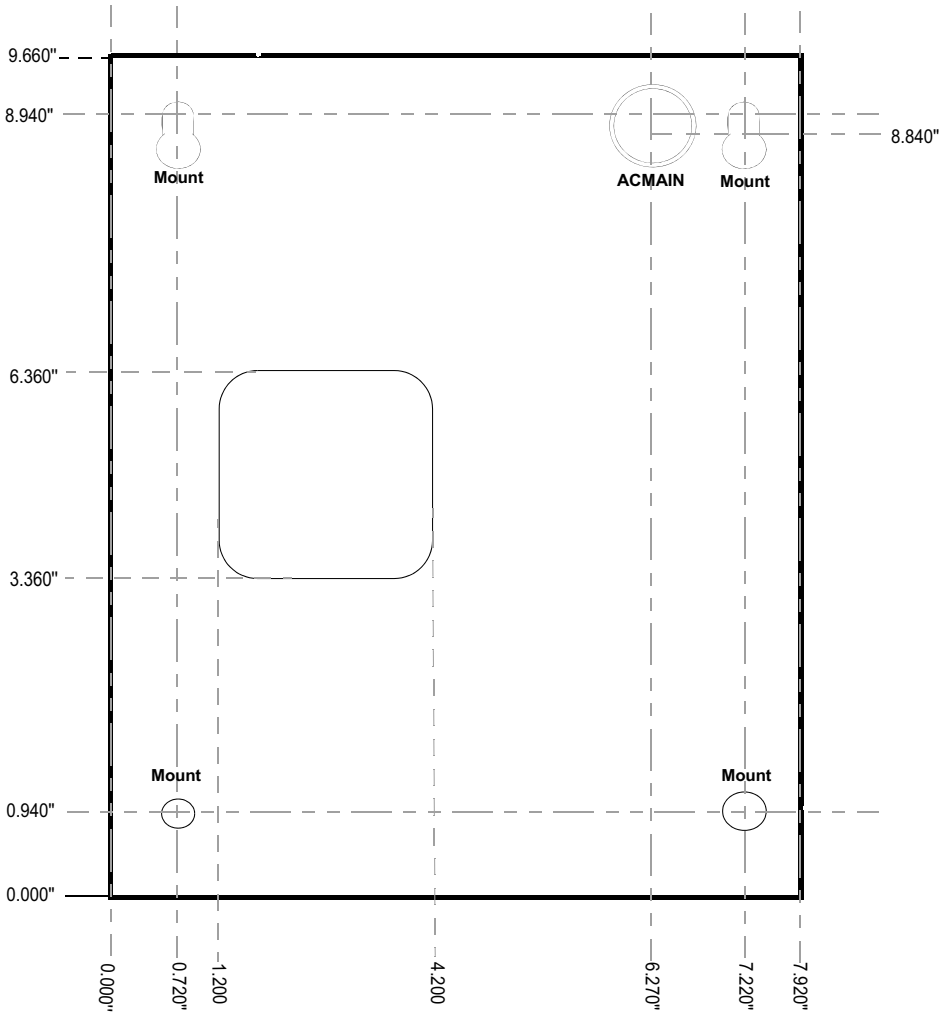


Figure 1-28 LC3000 Dimensions

Table 1-3: LC3000 Component Specifications

LC3000	Power	Input Voltage Range Input Frequency Input Current	120VAC 60Hz 1.4A, max
	Operating Environment	Temperature Relative Humidity Altitude	0 to +45C (+32 to +114F) 0 to 95 percent, non-condensing 0 -10,000 feet
	Non-Operating Environment	Temperature Relative Humidity Altitude	-20 to +70 C (-4 to +158F) 0 to 95 percent, non-condensing 0 - 35,000 feet
LE3/PSENCL with LCM20	Power	Input Voltage Range Input Frequency Input Current	120VAC 60Hz 1.4A, max
	Operating Environment	Temperature Relative Humidity Altitude	0 to +45C (+32 to +114F) 0 to 95 percent, non-condensing 0 -10,000 feet
	Non-Operating Environment	Temperature Relative Humidity Altitude	-20 to +70 C (-4 to +158F) 0 to 95 percent, non-condensing 0 - 35,000 feet
LE3/BRIDGE	Power	Input Voltage Range Input Frequency Input Current	9 to 30 VAC or 7 to 36 VDC 60Hz 0.12A, max
	Operating Environment	Temperature Relative Humidity Altitude	0 to +45C (+32 to +114F) 0 to 95 percent, non-condensing 0 -10,000 feet
	Non-Operating Environment	Temperature Relative Humidity Altitude	-20 to +70 C (-4 to +158F) 0 to 95 percent, non-condensing 0 - 35,000 feet
LWI3xxx	Power	Input Voltage Range Input Frequency Input Current	9 to 30 VAC or 7 to 36 VDC 60Hz 0.12A, max
	Operating Environment	Temperature Relative Humidity Altitude	0 to +45C (+32 to +114F) 0 to 95 percent, non-condensing 0 -10,000 feet
	Non-Operating Environment	Temperature Relative Humidity Altitude	-20 to +70 C (-4 to +158F) 0 to 95 percent, non-condensing 0 - 35,000 feet

Lithium Battery: There is a fire risk if the battery is replaced with an incorrect type. Proper disposal of a used battery is essential. Please follow the manufacturer's instructions.

Power Supply: *Replacing the power supply, if necessary, is simplified with a magnetic or clip screwdriver, such as the Craftsman No. 1 x 4 inch screwdriver shown. (Sears, item #00941362000, model #41362.*

LC3000 LAUNDRY READER DEFAULT CONFIGURATION SETTINGS

The LC3000 Laundry Reader's default settings are:

- DHCP enabled
- NP (host) IP address assigned by DHCP server

Restore Default Settings

Forget your password? Restore Default Settings.

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1 Connect a cable from a computer's serial port to the one labelled "RS-232 CONFIG".
Cable connections are shown in **RS-232 Config Port Connections** *(Page: 11) (Page 8).*

2 Open a terminal program (such as Hyperterminal), and then establish connection settings:
9600 baud
1 stop
no parity
no flow control

3 Type **xxx** within 3 seconds after "Config Task Started" is displayed in the terminal program.
"Restoring to Factory Defaults will display during reset.

4 Disconnect cable from **RS-232 CONFIG**.

MW9010/MW9012 LAUNDRY READER RETROFIT

BbTS Unix laundry centers with existing MW9010/MW9012 Laundry Readers can upgrade to the LC3000 Laundry Reader. Upgrading the Reader does not require wiring, LCM2s or laundry machine interface replacements.

The LC3000, as shipped from Blackboard, is configured for up to 60 machines on up to 3 LCM20s. Once the LC3000 is mounted and connected to the existing system, configure the LC3000 to communicate with existing LCM2s and existing interfaces.

The LC3000 communicates with 60 laundry machines.

Configure LC3000 for retrofit (wired laundry centers only)

1. Connect to the LC3000 using a RS-232 connection or Telnet.
2. Login using the default password: **IPrdr4U**.
3. At the prompt, type:

   ```
   machine alllcm2
   ```

   This configures the Reader to communicate with all connected laundry machines using the LCM2 interface.
4. Type **machines** to list the machine interfaces for all 60 machines.

Machine interface configurations are not affected by resetting Reader to the default configuration or other configuration commands.